IRRI
INTERNATIONAL RICE RESEARCH INSTITUTE

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from the Department for International Development

Linking farmers and science

Key fact:

By linking scientists, non-government organisations and government extension officials and farmers, the Poverty Elimination Through Rice Research Assistance (PETRRA) project in Bangladesh has achieved substantial improvements in rice production, income and empowerment of women.

Summary:

PETRRA's objective was to facilitate the development of a research system that was more responsive to the needs of resource-poor farmers. Over five years, 45 sub-projects were commissioned with more than 47 partner agencies. The project identified or developed more than ten significant technologies, improved methods for disseminating technologies and provided an opportunity for policymakers to engage with critical policy issues.

With higher yields and reduced expenditure on inputs, new technologies raised the incomes of resource-poor farmers significantly. Farmers' views and knowledge helped scientists adapt new technologies to make them more relevant and appropriate for their circumstances. By treating women and men equally and including them in all of the activities, PETRRA gave women access to knowledge that they were previously denied. The value-based management approach developed under PETRRA has demonstrated that traditional institutions, both national and international, can be innovative in creating an environment for the development of technology that is readily taken up by resource-poor farmers, men and women.

PETRRA has achieved substantial improvements in rice production *(Paul Van Mele)*

Facts & figures[1]

- Over five years PETRRA commissioned 45 sub-projects with more than 47 partner agencies representing national, international, and private organisations, universities, and NGOs.
- Inclusion of women increased from 10 to 41% over the course of the project.
- New technologies developed as part of the project increased rice self sufficiency by 1-2 months a year.
- A national rice seed network, SeedNet, was an innovation that began as a result of PETRRA. Fifty seed producing organisations had joined SeedNet by 2004, receiving breeder seed to multiply and then market within their localities. By 2008, the Bangladesh Rice Research Institute (BRRI) produced 101 tonnes of breeder seed, distributing it to 406 network members; up from one tonne and one client in 1997.
- By 2004, PETRRA was working with more than 18,000 farmers, of whom about 40% were women, in more than 550 villages across 37 districts and 102 *upazilas* (sub-districts).
- Bangladesh Rice Knowledge Bank (BRKB) website launched in 2004 making all the technologies developed under PETRRA freely available.
- Due to their success, the PETRRA women-to-women extension videos were awarded the bronze prize for effective communication by the International Visual Communications Association in 2004. The videos have been extensively used in Africa through AfricaRice and have been translated into more than 20 local languages.

PETRRA: From technology to livelihoods

Bangladesh is one of the poorest and most densely populated countries in the world. Rice occupies 75 per cent of Bangladesh's cropped area, contributes 81 per cent of dietary energy supply and dominates the livelihoods of the rural poor. However, despite remarkable gains in rice output over the last two decades, productivity levels within the sector are still much lower than their potential. However, by linking together scientists, non-government organisations, government extension officials and poor farmers, the Poverty Elimination Through Rice Research Assistance (PETRRA) project achieved substantial improvements in rice production, income and employment.

PETRRA gave women access to knowledge that they were previously denied *(Paul Van Mele)*

Funded by the UK's Department for International Development (DFID), and managed by the International Rice Research Institute (IRRI), in close partnership with the Bangladesh Rice Research Institute (BRRI), the Bangladesh Ministry of Agriculture and resource-poor farmers, PETRRA aimed to facilitate access to new technologies, enable local testing and adaptation of new varieties, and strengthen local research capacity. The project also focused on increasing recognition and broadening discussion of key policy issues, and piloted an effective and competitive rice research management scheme. Some of these principles are now being used by the Bangladesh Agriculture Research Council.

The main research priorities identified across the project sites were seed quality, lack of suitable modern rice varieties, and knowledge of rice cultivation, which were developed through extensive village-level consultations with poor households during 1999-2000. Forty-five sub-projects involving 47 partner agencies representing national, international, and private organisations, universities, and NGOs were commissioned for technology development, uptake methods, research and informing policy.

Farmers were engaged as research partners at all levels *(Paul Van Mele)*

From identifying problems to developing and validating technologies, farmers were engaged as research partners at all levels. Farmers' views and knowledge helped scientists adapt new technologies to make them more relevant and appropriate for their circumstances. With higher yields and reduced expenditure on inputs, new technologies raised the incomes of participating farmers significantly. On average, the new technologies increased rice self sufficiency by one-to-two months a year. Farmers were also able to raise extra income by selling rice seed, seedlings, and non-rice commodities that were part of the new livelihood system developed, which enabled them to invest in other non-farm activities, diversifying their livelihoods.

As well as developing new technologies and agricultural practices to increase productivity, PETRRA sought to transform rural institutions, policies and legislation that shaped rural livelihoods. Access to seed of new varieties was a high priority for farmers, so as well as developing a systematic approach for testing and validating new rice varieties directly with resource-poor farmers, BRRI established a national rice seed network, SeedNet. In 1997 BRRI

produced one tonne of breeder seed for its only client, the Bangladesh Agriculture Development Corporation (BADC). At the closure of PETRRA it had produced seven tonnes and supplied that seed to 54 network members. However, by 2008 this had increased to 101 tonnes of breeder seed that was supplied to 406 network members including BADC, large and small private seed companies and NGOs. The funding for this expansion was achieved through government projects. BRRI also launched the Bangladesh Rice Knowledge Bank (BRKB) website in 2004, making all the technologies developed under PETRRA freely available. The BRKB is continually updated, reflecting the continuity of activity.

By including women in all activities, PETRRA gave women access to knowledge that they were previously denied. Seven sub-projects focused specifically on women and over the course of the project, inclusion of women increased from 10 to 41 per cent. Women received training in all aspects of rice technologies including seed storage, crop processing, seedbed preparation, fertiliser use and pest management. As a result, women have been empowered to share decisions about rice cultivation with their husbands, increased their self-esteem and given them confidence to participate more widely in farming activities.

PETRRA also developed and improved methods for disseminating technologies, including women-to-women extension through video. Women in rural Bangladesh are often not allowed to visit other villages, which constrains extension initiatives because women trained in one village cannot share their experience in others. By involving women in the development and validation of the videos, these communication barriers were reduced, leading to significant changes in post-harvest practices. Jean Delion, a World Bank senior social development specialist, described the video project as “a unique example whereby partnerships, participatory processes and pride have been cultivated from technology development all the way to technology dissemination.”

PETRRA has empowered women *(Paul Van Mele)*

The project resulted in the identification or development of more than ten significant technologies, including quality seed management, optimising nutrient management with the Leaf Colour Chart (LCC), reduced insecticide application, improvement of coastal water resources, integrated crop management and value chain addition for aromatic rice production, processing and marketing. The Rice-Duck production system, for example, whereby ducks weeded the rice, controlled the insects and duck droppings reduced the need for chemical fertilisers, resulted in paddy yields increasing by one tonne per hectare and profits rising by over 100 per cent.

As part of the project, policymakers and leading intellectuals were also invited to policy dialogues on seed delivery systems, seed policy, the strengthening of rice research and extension linkages, biotechnology research, and women’s contribution to rural economic activities. Village research fed directly into the policy dialogues.

By the end of PETRRA, the value of partnerships, networks and linkages was recognised by everyone who had been involved. Scientists realised the benefits of working with other partners, seed companies broadened their activities by linking with government agencies, and involvement in meetings allowed partners to network with new contacts. The evidence of learning stimulated by PETRRA amongst the partners and sub-projects was apparent in the confidence that has influenced new projects and thinking which has impacted traditional government research and development institutions, NGOs and the private sector.

Testimonials:

- **Farmer working with Seed Health Improvement Project (SHIP)**: "Four years back my own production from land could meet five months' need of rice. The rest would come from borrowing or help. Now, both my husband and I are working hard and get 100 maunds of rice from the same amount of land on which we received 50 maunds before."

- **Mondal, a scientist from BRRI**: "I had the impression that I did not need the help of others as I would do the research myself. I thought I could tackle all kinds of problems in the field including the social aspects. But when we started to work together closely then I noticed that all partners brought in different ideas to address different issues and we could utilize all innovative ideas. We achieved many things very quick which could not have achieved had we not had those partnerships."

- **Dr. M.A. Salam, former Head of Plant Breeding and now Director of Research, BRRI**: "PETRRA tried to empower women through their involvement in all stages in the decision making process. If we could involve women more, the more they could be empowered. It was very useful from the perspective of Bangladesh. Women in Bangladesh are not empowered. If we could reduce the disparity between men and women, then a balanced situation would be created; society and family at large would benefit from it."

- **C.A. Mannan, HEED Bangladesh, NGO**: "From the experience of working with the women, I realised that if knowledge is provided to both men and women, then they together could learn and share it better and, as the men were much more busy with off-farm work and could not give enough time and attention, I thought women would be a better choice to use the knowledge… Women-to-women technology dissemination was easier done."

Additional case study information

Costs and benefits:[2]

- An in-depth study on the Seed Health sub-project concluded that the rice income of trained farmers was higher than those that were not, and costs of this one project were almost recovered from the incremental rice output obtained in one year in the sample areas of operation of SHIP. Women also became seed managers, more mobile and were more involved in seed selections and agricultural practices.
- For the breeder seed network, SeedNet, this grew from one-to-two tonnes of breeder seed produced by one public sector institution to 100 tonnes of breeder seed produced by over 450 public, private and non-governmental organisations.

DFID contribution to research:

The PETRRA project was a five year project from 1999 to 2004. DFID provided a grant of £9.5 million.

Research milestones:

- 1999-2000 Ten village-level consultations with poor households.
- 2000-2002 Commissioning of 45 subprojects with 47 institutions/organisations.
- 2002 Launch of SeedNet by BRRI with more than 450 organisations in 2010 and the distribution of 80-100 tonnes of breeder seed annually.
- 2004 The northwest focal area forum for local actors began operating independently.
- 2004 BRRI launched the Bangladesh Rice Knowledge Bank (BRKB).

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Paul Van Mele: For high res images contact Maria Clabita (t.clabita@cgiar.org)

Multi-media material:
Rice videos: http://www.africarice.org/warda/guide-video.asp
Seed sorting by floatation: http://www.youtube.com/watch?v=h9Oy-ftKXoc

Links:
IRRI: www.irri.org
Bangladesh Rice Knowledge Bank: www.knowledgebank-brri.org

Main reference:
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[1] Facts and figures sourced from: Magor, Salahuddin, Hague, Biswas and Bannerman (eds.), (2007) *PETRRA - an experiment in pro-poor agricultural research*. Dhaka (Bangladesh)
[2] Magor, Salahuddin, Hague, Biswas and Bannerman (eds.), (2007) *PETRRA - an experiment in pro-poor agricultural research*. Dhaka (Bangladesh)

DFID Department for International Development

DFID, the Department of International Development, is the part of the UK government that manages Britain's aid to poor countries and works to get rid of extreme poverty.

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